Master Environmental Library
(MEL)

Software Test Plan

June 17, 1997

Defense Modeling and Simulation Office
Alexandria, VA

MASTER ENVIRONMENTAL LIBRARY
(MEL)

SOFTWARE TEST PLAN

JUNE 17, 1997

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APPROVAL:

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DIRECTOR,
DEFENSE MODELING AND SIMULATION OFFICE

FOREWORD

The Defense Modeling and Simulation Office (DMSO) was established to serve as the executive secretariat for the Executive Council on Modeling and Simulation (EXCIMS), and to provide a full-time focal point for information concerning Department of Defense (DoD) Modeling and Simulation (M&S) activities. The DMSO promulgates M&S policy, initiatives, and guidance to promote cooperation among DoD components to maximize efficiency and effectiveness. The DMSO is a staff activity reporting to the Director, Defense Research and Engineering (DDR&E), office of the Undersecretary of Defense for Acquisition and Technology (USD(A&T)).

This document will be reviewed and updated by the DMSO as required to maintain its currency. Comments and recommendations should be forwarded for review and possible inclusion to the:

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> 1901 N. Beauregard St., Suite 504
> Alexandria, VA 22311
> (703) 998-0660

LIST OF EFFECTIVE PAGES

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RECORD OF CHANGES

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SECTION 1. SCOPE

1.1 IDENTIFICATION

This *Software Test Plan* pertains to the Computer Software Configuration Items (CSCIs) and software components associated with the Master Environmental Library (MEL).

1.2 SYSTEM OVERVIEW

The MEL is an Internet-based data discovery and retrieval system that provides access to geographically distributed oceanographic, meteorological, terrain, and near-space databases. The primary user interface occurs at the MEL Access Site, consisting of an Internet HTTP Server (also referred to as the Web server) that supports Hypertext Markup Language (HTML) and Java interfaces, and other supporting Common Gateway Interface (CGI) programs.   The MEL is based on a library paradigm with the MEL Access Site representing the 'library' where users query a distributed 'card catalog.' The 'cards' in the 'card catalog' serve as a common denominator among different types of data in the library. These 'cards' consist of metadata records that comply with the United States Federal Geographic Data Committee (FGDC) content standards for digital geo-spatial metadata.

MEL users search for and order available data using a World Wide Web (WWW) browser. They may choose either the HTML or Java interface to interactively create a Query and then a Request for data. Such Queries and Requests include a region of interest, time range, category keywords, and data center elements. The Query searches metadata records for all the Regional Sites specified in the Query. Query results are presented to the user who can then examine the full text of the metadata record, view the browse graphics associated with the metadata record, link directly to the data or data center, or generate an order form customized for the chosen dataset. The Java Query provides an interactive interface that allows information to be visually compared, thus guiding users through a potentially large set of resultant data that meet the user's query criteria to the specific datasets of interest. Users can order existing datasets, or where applicable, subscribe to receive datasets automatically as they are produced.

Orders for data are sent to the respective MEL Regional Site by electronic mail (e-mail) and processed by the MEL Regional Site Software (MRSS). This customizable software parses the e-mail orders, provides access control, handles scheduling of requests, extracts data from the local databases, formats, compresses, encrypts (if necessary) and delivers the data files, and then notifies the user by e-mail of the order delivery.

SOFTWARE TEST PLAN

The MEL project is sponsored by the Defense Modeling and Simulation Office (DMSO), under the direction and funding of DMSO Executive Agents (EA) for air and space, oceans, and terrain. The MEL Project Manager is Dr. Richard Siquig of the Naval Research Laboratory (NRL), Monterey.

1.3 DOCUMENT OVERVIEW

This *Software Test Plan* describes plans and procedures for qualification testing of CSCIs and software systems in the MEL, including the: MEL Access Site Software (MASS) 1.1, MEL Regional Site Software (MRSS) 1.1, MEL User Site Software (MUSS), and Metadata. It describes the test environment to be used, identifies the tests to be performed, provides schedules for testing activities, and provides requirements traceability between software requirements and tests that address them.
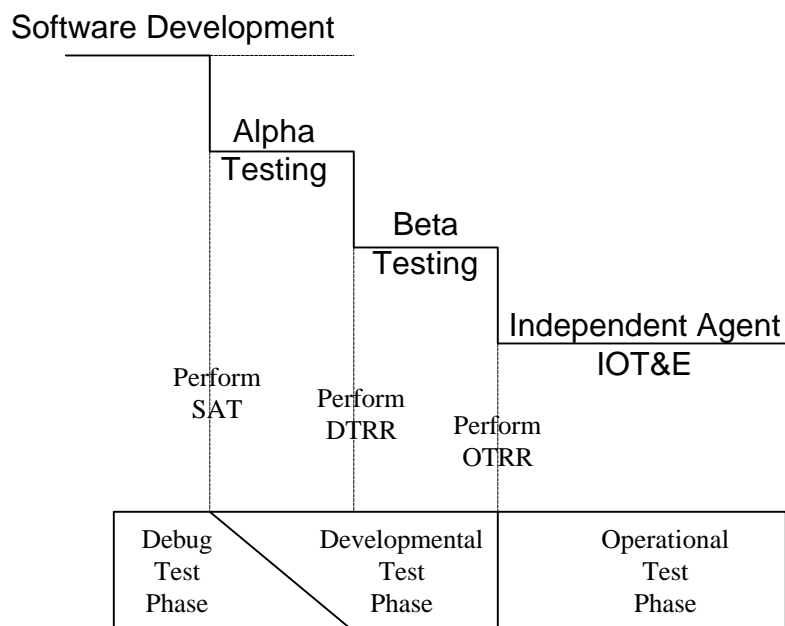
Figure 1-1. MEL Testing Phases

Figure 1-1 depicts the overall development and testing phases for the MEL project. Each MEL Component Manager (MCM) will be responsible for testing to ensure satisfaction of the performance, portability, interoperability, scalability, reliability, maintainability and accuracy criteria for their CSCIs or components.

The MCMs will conduct a software acceptance test (SAT) prior to entering the Alpha Test phase. The software must be baselined and under Configuration Management (CM) prior to this test. During the debugging test phase, the software will be subjected to Alpha testing by subject matter experts designated by the MEL Project Manager. After the software has met the Alpha testing exit criteria, it will be subjected to Beta testing by organizations designated by the MEL Project Manager. Beta testing will exercise the entire software suite to assess

its compliance with established test objectives. Generally, it will not be possible for the Beta testers to separate the functionality of the individual CSCIs once they are made available to them, so the Beta testing will concentrate on system qualification testing of the individual subsystems which will involve one or more CSCI. Beta tests will be considered to be complete once the Developmental Testing (DT) exit criteria are met. An Operational Test Readiness Review (OTRR) will be conducted to determine whether the software is ready to enter the Initial Operational Testing & Evaluation (IOT&E) phase. The MEL Project Manager will designate the independent agent(s) to perform the IOT&E, monitored by Joint Interoperability Testing Center (JITC) representatives.

1.4 RELATIONSHIP TO OTHER PLANS

The MEL will be tested as part of the Modeling and Simulation Resource Repository when the test plans for that system are made available.

SECTION 2. REFERENCED DOCUMENTS

2.1 GOVERNMENT DOCUMENTS

a. United States. DMSO. **MEL Software Requirement Specification**, Version 1.0. Alexandria: DMSO, June 1997.

b. United States. DMSO. **MEL Software Version Description**, Version 1.0. Alexandria: DMSO, 14 May 1997.

c. United States. DMSO. **MEL Software User Manual**, Version 1.0. Alexandria: DMSO, June 1997.

2.2 NON-GOVERNMENT DOCUMENTS

None

SECTION 3. TEST ENVIRONMENT

MEL software testing will take place at different sites depending on the test phase. The Alpha tests will be conducted at the respective software development sites. The Beta tests will be conducted at the sites where the subject software is installed, but the testers could be located anywhere on the Internet. The IOT&E tests will be conducted for each new software installation before it is declared operational. The following sections describe the test environments for the MASS, the MRSS, and the MUSS. The subsystem tests cover the Query, Metadata, Order, Subscription, Administration, and the Testing Subsystems.

3.1 MASS TEST SITES

The MASS will be tested at the sites where it is installed. These are planned to include:

a. NRL, Monterey, CA

b. Naval Oceanographic Office (NAVOCEANO), Stennis Space Center, MS

c. National Imagery and Mapping Agency (NIMA), Bethesda, MD

3.1.1 SOFTWARE ITEMS

In addition to the MASS itself, such items include the operating systems, compilers, communications and applications software, input files, code auditors, components, test drivers and test data generators, databases, and input files necessary to accomplish the planned testing activities at the MASS test sites.

3.1.2 HARDWARE ITEMS

To Be Determined (TBD)

> (The Data Item Description (DID) states that, "This paragraph shall identify by name, number and version, as applicable, the computer hardware, interfacing equipment, communications equipment, test data reduction equipment, apparatus such as extra peripherals (tape drives, printers, plotters), test message generators, test timing devices, test event records, etc. and firmware items that will be used in the software test environment at the test site(s). This paragraph shall describe the purpose of each item, state the period of usage and number of each item needed, identify those that are expected to be supplied by the sites, and identify any classified or other security or privacy issues associated with the items.")

3.1.3 OTHER MATERIALS

TBD

> (The DID states that, "This paragraph shall identify and describe any other materials needed for the testing at the test site(s). These materials may include manuals, software listings, media containing the software to be tested, media containing data to be used in the tests, sample listings of outputs, and other forms or instructions. This paragraph shall identify those items that are to be delivered to the site and those that are expected to be supplied by the site. The description shall include the type, layout, and quantity of the materials, as applicable. This paragraph shall identify any classified processing or other security or privacy issues associated with the items.")

3.1.4 PROPRIETARY NATURE, ACQUIRER'S RIGHTS, AND LICENSING

TBD

> (The DID states that, "This paragraph shall identify the proprietary nature, acquirer's rights, and licensing issues associated with each element of the software test environment.")

3.1.5 INSTALLATION, TESTING, AND CONTROL

TBD

> (The DID states that, "This paragraph shall identify the developer's plans for performing each of the following, possibly in conjunction with personnel at the test site:
>
> a. Acquiring or developing each element of the software test environment.
>
> b. Installing and testing each item of the software test environment prior to its use
>
> c. Controlling and maintaining each item of the software test environment.")

3.1.6 PARTICIPATING ORGANIZATIONS

The following organizations will participate in the MASS testing:

a. NRL, Monterey, CA

b. NAVOCEANO, Stennis Space Center, MS

    c. NIMA, Bethesda, MD

3.1.7 PERSONNEL

TBD

> (The DID states that, "This paragraph shall identify the number, type, and skill level of personnel needed during the test period at the test site(s), the dates and times they will be needed, and any special needs, such as multi-shift operation and retention of key skills to ensure continuity and consistency in extensive test programs.")

3.1.8 ORIENTATION PLAN

TBD

> (The DID states that, "This paragraph shall describe any orientation and training to be given before and during the testing. This information shall be related to the personnel needs given in paragraph 3.1.7. This training may include user instruction, operator instruction, maintenance and control group instruction, and orientation briefings to staff personnel. If extensive training is anticipated, a separate plan may be developed and referenced here.")

3.1.9 TESTS TO BE PERFORMED

The following tests will be performed on the MASS:

    a. Compatibility of the HTML Application Programming Interface (API) and the JAVA API to search all metadata

    b. Support of the HTML Graphical User Interface (GUI) and the JAVA GUI to select spatial, temporal, keyword, and regional site subsets of library holdings

    c. Conformance of the HTML and JAVA GUIs to user expectations and clear "intuitive feel"

    d. Support of a software API to perform all the functions of either GUI

    e. Ability of the user profile system to properly identify users and reject invalid requests

    f. Ability of the internal encryption system to protect system integrity and to deliver encrypted data to users

    g. Ability to meet latency requirements

    h. Ability to meet load scalability requirements

i. Ability to support online user help and other documentation

3.2 MRSS TEST SITES

The MRSS will be tested at the sites where it is installed. These are planned to include:

a. NRL, Monterey, CA

b. NAVOCEANO, Stennis Space Center, MS

c. Coastal and Hydraulics Laboratory (CHL), Vicksburg, MS

d. Mississippi State University/Center for Air Sea Technology (MSU/CAST), Stennis Space Center, MS

e. Air Force Global Weather Center (AFGWC), Offutt AFB, NE

f. Air Force Combat Climatology Center (AFCCC), Scott AFB, IL

g. Simulator Database Facility (SDBF), Albuquerque, NM

h. NIMA, Bethesda, MD

3.2.1 SOFTWARE ITEMS

In addition to the MRSS itself, software items include the operating systems, compilers, communications and applications software, input files, code auditors, components, test drivers and test data generators, databases, and input files necessary to accomplish the planned testing activities at the MRSS test sites.

3.2.2 HARDWARE ITEMS

TBD

> (The Data Item Description (DID) states that, "This paragraph shall identify by name, number and version, as applicable, the computer hardware, interfacing equipment, communications equipment, test data reduction equipment, apparatus such as extra peripherals (tape drives, printers, plotters), test message generators, test timing devices, test event records, etc. and firmware items that will be used in the software test environment at the test site(s). This paragraph shall describe the purpose of each item, state the period of usage and number of each item needed, identify those that are expected to be supplied by the sites, and identify any classified or other security or privacy issues associated with the items.")

3.2.3 OTHER MATERIALS

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3.2.5 INSTALLATION, TESTING, AND CONTROL

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(The DID states that, "This paragraph shall identify the developer's plans for performing each of the following, possibly in conjunction with personnel at the test site:

a. Acquiring or developing each element of the software test environment

b. Installing and testing each item of the software test environment prior to its use

c. Controlling and maintaining each item of the software test environment")

3.2.6 PARTICIPATING ORGANIZATIONS

The following organizations will be participating in the MRSS tests:

    a. NRL, Monterey, CA

    b. NAVOCEANO, Stennis Space Center, MS

    c.   CHL, Vicksburg, MS

    d.   MSU/CAST, Stennis Space Center, MS

    e.   AFGWC, Offutt AFB, NE

    f.   AFCCC, Scott AFB, IL

    g.   SDBF, Albuquerque, NM

    h.   NIMA, Bethesda, MD

3.2.7 PERSONNEL

TBD

> (The DID states that, "This paragraph shall identify the number, type, and skill level of personnel needed during the test period at the test site(s), the dates and times they will be needed, and any special needs, such as multi-shift operation and retention of key skills to ensure continuity and consistency in extensive test programs.")

3.2.8 ORIENTATION PLAN

TBD

> (The DID states that, "This paragraph shall describe any orientation and training to be given before and during the testing. This information shall be related to the personnel needs given in paragraph 3.2.7. This training may include user instruction, operator instruction, maintenance and control group instruction, and orientation briefings to staff personnel. If extensive training is anticipated, a separate plan may be developed and referenced here.")

3.2.9 TESTS TO BE PERFORMED

The following tests will be performed on the MRSS:

    a.   Ability to serve short metadata information (titles)

    b.   Ability to serve full metadata records

    c.   Ability to deliver data in the "GET NOW" mode

    d.   Ability to deliver data in the "SUBSCRIBE" mode

    e.   Ability to detect and reject invalid e-mail requests, including:

        (1)   E-mail that is not a valid MEL request

          (2)   Requests from unauthorized users

    f.   Ability to recover from a failed "FTP PUT" delivery

    g.   Ability to delete subscription or order

    h.   Ability to meet load scalability requirements

3.3 MUSS TEST SITES

The MUSS consists of downloadable JAVA applets that are run on the user's computer under a special environment provided by that user's Web browser. This environment is known as the Virtual Java Machine (VJM). All popular Web browsers include a VJM in their current release, and there are also stand-alone VJM implementations. Because of the variety of user hardware and operating systems supported by the MEL, only the MEL applets can be tested in VJM implementations.

It is also important to test the HTML software used by the MEL to ensure it conforms to standards that are in use by the majority of users.

3.3.1 SOFTWARE ITEMS

In addition to the MUSS itself, software items include the operating systems, compilers, communications and applications software, input files, code auditors, components, test drivers and test data generators, databases, and input files necessary to accomplish the planned testing activities at the MUSS test sites.

3.3.2 HARDWARE ITEMS

TBD

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3.3.6 PARTICIPATING ORGANIZATIONS

TBD

(The DID states that, "This paragraph shall identify the organizations that will participate in the testing at the test site(s) and the roles and responsibilities of each.")

3.3.7 PERSONNEL

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3.3.8 ORIENTATION PLAN

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3.3.9 TESTS TO BE PERFORMED

The following tests will be performed on the MUSS:

    a. MEL compliance to HTML standards

    b. Interoperability of the MEL JAVA applets on a matrix of user platforms

    c. Conformance of the MEL GUI to DoD standards

3.4 QUERY SUBSYSTEM TEST SITES

The Query Subsystem consists of the portions of the MUSS, MASS, and MRSS CSCIs that support the ability of the user to search metadata to locate the metadata for the dataset(s) of interest.

SOFTWARE TEST PLAN

> NOTE: Subsystem testing is always through the MASS, either automatically with a simulated MUSS, using a portion of the Testing Subsystem, or manually from a MUSS.

3.4.1 SOFTWARE ITEMS

To test the Query Subsystem there must be an installed MUSS, MASS, and MRSS on a common network. Other software items include the operating systems, communications and applications software, input files, test drivers and test data generators, databases, test control software, and input files necessary to accomplish the planned testing activities. The automatic test software simulates the MUSS for much of this testing, allowing many parameters to be tested in a short time. The MUSS is also tested with the MASS and MRSS manually.

3.4.2 HARDWARE ITEMS

The computers and networks to support the MUSS, MASS, MRSS and Testing Subsystem.

3.4.3 OTHER MATERIALS

TBD

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3.4.5 INSTALLATION, TESTING, AND CONTROL

TBD

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> c. Controlling and maintaining each item of the software test environment")

3.4.6 PARTICIPATING ORGANIZATIONS

TBD

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3.4.7 PERSONNEL

TBD

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3.4.8 ORIENTATION PLAN

TBD

> (The DID states that, "This paragraph shall describe any orientation and training to be given before and during the testing. This information shall be related to the personnel needs given in paragraph 3.4.7. This training may include user instruction, operator instruction, maintenance and control group instruction, and orientation briefings to staff personnel. If extensive training is anticipated, a separate plan may be developed and referenced here.")

3.4.9 TESTS TO BE PERFORMED

The following tests will be performed on the Query Subsystem:

  a. The ability to query and find all the MEL Metadata

  b. The ability of the Subsystem to perform queries by geospatial region

  c. The ability of the Subsystem to perform queries in the time domain

  d. The ability of the Subsystem to perform queries by keyword

  e. The ability of the Subsystem to perform queries by selecting Regional Site

  f. The ability of the Subsystem to meet the stress test and error handling requirements

3.5 METADATA TEST SITES

Metadata, both in FGDC and Machine Readable Catalog (MARC) content standards, are critical to MEL operations. A metadata record is technically a document, however, it is indexed, searched, and used to generate the order form. Any errors would be a critical barrier to the user being able to locate or order the data described by the metadata. For this reason, metadata must be tested using the same methodology as software. Testing is done just as for the software, independently as a CSCI Alpha test; and as a subsystem accessed through the MASS using the Testing Subsystem.

3.5.1 SOFTWARE ITEMS

Once created, the MEL metadata must be tested by the software that accesses it to ensure complete computer and human compatibility.

3.5.2 HARDWARE ITEMS

NOT APPLICABLE

3.5.3 OTHER MATERIALS

TBD

> (The DID states that, "This paragraph shall identify and describe any other materials needed for the testing at the test site(s). These materials may include manuals, software listings, media containing the software to be tested, media containing data to be used in the tests, sample listings of outputs, and other forms or instructions. This paragraph shall identify those items that are to be delivered to the site and those that are expected to be supplied by the site. The description shall include the type, layout, and quantity of the materials, as applicable. This paragraph shall identify any classified processing or other security or privacy issues associated with the items.")

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3.5.6 PARTICIPATING ORGANIZATIONS

Each sponsoring MEL Regional Site Manager will assume a role similar to the MCM for software testing, and will assign outside testers to test the metadata using the same methodology as described previously, making metadata available only upon satisfactory completion of the OTRR.

3.5.7 PERSONNEL

TBD

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3.5.8 ORIENTATION PLAN

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3.5.9 TESTS TO BE PERFORMED

The following tests will be performed on the Metadata:

    a. Completeness - ensure that all the MEL required fields are complete (FGDC and MARC)

    b. Accuracy - check for correct information

    c. Understandability - avoidance of jargon, use of simple terms enhancing user comprehension

    d. Order form - ensure the metadata generates a proper order form (layout, default subsets, etc.)

    e. Default order - ensure the default order is valid and within the maximum parameters set at the host MRSS

f. Keyword - ensure the desired keywords are present and none of the undesired keywords are present in searchable fields

3.6 ORDER TEST SITES

The Order Subsystem is a component of the MUSS, MASS, and MRSS CSCIs. The order is processed from the MUSS through the MASS to the MRSS, where the bulk of the processing takes place. Automatic testing is done using the Testing Subsystem. Manual testing is done using the MUSS.

3.6.1 SOFTWARE ITEMS

In addition to the MUSS itself, software items include the operating systems, compilers, communications and applications software, input files, code auditors, components, test drivers and test data generators, databases, and input files necessary to accomplish the planned testing activities at the ORDER test sites.

3.6.2 HARDWARE ITEMS

TBD

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3.6.9 TESTS TO BE PERFORMED

The following tests will be performed on the Order Subsystem:

   a. The ability to order all or a portion of each MEL dataset

   b. The ability to extract, format, and deliver arbitrary planes of multi-dimensional data

   c. The ability of the Subsystem to utilize all the advertised delivery methods (FTP, HTML, e-mail, etc.)

3.7 SUBSCRIPTION TEST SITES

The Subscription Subsystem involves that portion of the MRSS CSCI that ingests new data, finds the users who want a copy of the new data, and delivers it to the user applying the method specified by the user. However, at the subsystem level requests are processed through the MASS from the MUSS or a Testing Subsystem simulating the MUSS. This is an extension of the Subscribe test done as part of the MRSS CSCI qualification test.

3.7.1 SOFTWARE ITEMS

All Subsystem tests are done through the MASS to the MRSS, which is capable of ingesting new data from the data source. A MUSS and Testing Subsystem are also necessary.

3.7.2 HARDWARE ITEMS

TBD

> (The Data Item Description (DID) states that, "This paragraph shall identify by name, number and version, as applicable, the computer hardware, interfacing equipment, communications equipment, test data reduction equipment, apparatus such as extra peripherals (tape drives, printers, plotters), test message generators, test timing devices, test event records, etc. and firmware items that will be used in the software test environment at the test site(s). This paragraph shall describe the purpose of each item, state the period of usage and number of each item needed, identify those that are expected to be supplied by the sites, and identify any classified or other security or privacy issues associated with the items.")

3.7.3 OTHER MATERIALS

TBD

(The DID states that, "This paragraph shall identify and describe any other materials needed for the testing at the test site(s). These materials may include manuals, software listings, media containing the software to be tested, media containing data to be used in the tests, sample listings of outputs, and other forms or instructions. This paragraph shall identify those items that are to be delivered to the site and those that are expected to be supplied by the site. The description shall include the type, layout, and quantity of the materials, as applicable. This paragraph shall identify any classified processing or other security or privacy issues associated with the items.")

3.7.4 PROPRIETARY NATURE, ACQUIRER'S RIGHTS, AND LICENSING

TBD

(The DID states that, "This paragraph shall identify the proprietary nature, acquirer's rights, and licensing issues associated with each element of the software test environment.")

3.7.5 INSTALLATION, TESTING, AND CONTROL

TBD

(The DID states that, "This paragraph shall identify the developer's plans for performing each of the following, possibly in conjunction with personnel at the test site:

a. Acquiring or developing each element of the software test environment

b. Installing and testing each item of the software test environment prior to its use

c. Controlling and maintaining each item of the software test environment")

3.7.6 PARTICIPATING ORGANIZATIONS

TBD

(The DID states that, "This paragraph shall identify the organizations that will participate in the testing at the test site(s) and the roles and responsibilities of each.")

3.7.7 PERSONNEL

TBD

> (The DID states that, "This paragraph shall identify the number, type, and skill level of personnel needed during the test period at the test site(s), the dates and times they will be needed, and any special needs, such as multi-shift operation and retention of key skills to ensure continuity and consistency in extensive test programs.")

3.7.8 ORIENTATION PLAN

TBD

> (The DID states that, "This paragraph shall describe any orientation and training to be given before and during the testing. This information shall be related to the personnel needs given in paragraph 3.7.7. This training may include user instruction, operator instruction, maintenance and control group instruction, and orientation briefings to staff personnel. If extensive training is anticipated, a separate plan may be developed and referenced here.")

3.7.9 TESTS TO BE PERFORMED

The following tests will be performed on the Subscribe Subsystem:

   a.   Ability to place a subscription

   b.   Ability to cancel a subscription

   c.   Ability to check the status of a subscription

   d.   Ability to receive data when a subscribed dataset changes

3.8 DATA TEST SITES

The data served through the MEL will be in standard formats according to the type of data. The tests described in this section evaluate the MEL content against the requirements and the compliance to established standards.

3.8.1 DATA ITEMS

MEL data.

3.8.2 HARDWARE ITEMS

TBD

> (The Data Item Description (DID) states that, "This paragraph shall identify by name, number and version, as applicable, the computer hardware, interfacing equipment, communications equipment, test data reduction equipment, apparatus such as extra peripherals (tape drives, printers, plotters), test message generators, test timing devices, test event records, etc. and firmware items that will be used in the software test environment at the test site(s). This paragraph shall describe the purpose of each item, state the period of usage and number of each item needed, identify those that are expected to be supplied by the sites, and identify any classified or other security or privacy issues associated with the items.")

3.8.3 OTHER MATERIALS

TBD

> (The DID states that, "This paragraph shall identify and describe any other materials needed for the testing at the test site(s). These materials may include manuals, software listings, media containing the software to be tested, media containing data to be used in the tests, sample listings of outputs, and other forms or instructions. This paragraph shall identify those items that are to be delivered to the site and those that are expected to be supplied by the site. The description shall include the type, layout, and quantity of the materials, as applicable. This paragraph shall identify any classified processing or other security or privacy issues associated with the items.")

3.8.4 PROPRIETARY NATURE, ACQUIRER'S RIGHTS, AND LICENSING

TBD

> (The DID states that, "This paragraph shall identify the proprietary nature, acquirer's rights, and licensing issues associated with each element of the software test environment.")

3.8.5 INSTALLATION, TESTING, AND CONTROL

TBD

(The DID states that, "This paragraph shall identify the developer's plans for performing each of the following, possibly in conjunction with personnel at the test site:

a. Acquiring or developing each element of the software test environment

b. Installing and testing each item of the software test environment prior to its use

c. Controlling and maintaining each item of the software test environment")

3.8.6 PARTICIPATING ORGANIZATIONS

TBD

(The DID states that, "This paragraph shall identify the organizations that will participate in the testing at the test site(s) and the roles and responsibilities of each.")

3.8.7 PERSONNEL

TBD

(The DID states that, "This paragraph shall identify the number, type, and skill level of personnel needed during the test period at the test site(s), the dates and times they will be needed, and any special needs, such as multi-shift operation and retention of key skills to ensure continuity and consistency in extensive test programs.")

3.8.8 ORIENTATION PLAN

TBD

(The DID states that, "This paragraph shall describe any orientation and training to be given before and during the testing. This information shall be related to the personnel needs given in paragraph 3.8.7. This training may include user instruction, operator instruction, maintenance and control group instruction, and orientation briefings to staff personnel. If extensive training is anticipated, a separate plan may be developed and referenced here.")

3.8.9 TESTS TO BE PERFORMED

The following tests will be performed on the MEL data:

    a. Completeness - compare available data to data requirements

    b. Properly Formatted - ensure the data delivered is in one of the formats, units, and coordinate systems assigned for the data type

    c. Deliverability - ensure fully compliant data is deliverable as advertised. Type 1 compliant data delivery must have an existent URL.

3.9 ADMINISTRATION TEST SITES

The MEL Administration Subsystem consists of a CSCI that interacts with the MASS and MRSS to perform necessary tasks to operate the MEL. These include metadata generation support, MASS performance and access logs, and MRSS performance and access logs.

3.9.1 SOFTWARE ITEMS

In addition to the Administration Subsystem itself, software items include the operating systems, compilers, communications and applications software, input files, code auditors, components, test drivers and test data generators, databases, and input files necessary to accomplish the planned testing activities at the Administration test sites.

3.9.2 HARDWARE ITEMS

TBD

> (The Data Item Description (DID) states that, "This paragraph shall identify by name, number and version, as applicable, the computer hardware, interfacing equipment, communications equipment, test data reduction equipment, apparatus such as extra peripherals (tape drives, printers, plotters), test message generators, test timing devices, test event records, etc. and firmware items that will be used in the software test environment at the test site(s). This paragraph shall describe the purpose of each item, state the period of usage and number of each item needed, identify those that are expected to be supplied by the sites, and identify any classified or other security or privacy issues associated with the items.")

3.9.3 OTHER MATERIALS

TBD

> (The DID states that, "This paragraph shall identify and describe any other materials needed for the testing at the test site(s). These materials may include manuals, software listings, media containing the software to be tested, media containing data to be used in the tests, sample listings of outputs, and other forms or instructions. This paragraph shall identify those items that are to be delivered to the site and those that are expected to be supplied by the site. The description shall include the type, layout, and quantity of the materials, as applicable. This paragraph shall identify any classified processing or other security or privacy issues associated with the items.")

3.9.4 PROPRIETARY NATURE, ACQUIRER'S RIGHTS, AND LICENSING

TBD

> (The DID states that, "This paragraph shall identify the proprietary nature, acquirer's rights, and licensing issues associated with each element of the software test environment.")

3.9.5 INSTALLATION, TESTING, AND CONTROL

TBD

> (The DID states that, "This paragraph shall identify the developer's plans for performing each of the following, possibly in conjunction with personnel at the test site:
>
> a. Acquiring or developing each element of the software test environment
>
> b. Installing and testing each item of the software test environment prior to its use
>
> c. Controlling and maintaining each item of the software test environment")

3.9.6 PARTICIPATING ORGANIZATIONS

TBD

> (The DID states that, "This paragraph shall identify the organizations that will participate in the testing at the test site(s) and the roles and responsibilities of each.")

3.9.7 PERSONNEL

TBD

> (The DID states that, "This paragraph shall identify the number, type, and skill level of personnel needed during the test period at the test site(s), the dates and times they will be needed, and any special needs, such as multi-shift operation and retention of key skills to ensure continuity and consistency in extensive test programs.")

3.9.8 ORIENTATION PLAN

TBD

> (The DID states that, "This paragraph shall describe any orientation and training to be given before and during the testing. This information shall be related to the personnel needs given in paragraph 3.9.7. This training may include user instruction, operator instruction, maintenance and control group instruction, and orientation briefings to staff personnel. If extensive training is anticipated, a separate plan may be developed and referenced here.")

3.9.9 TESTS TO BE PERFORMED

The following tests will be performed on the MUSS:

a. The ability to install and index new metadata

b. The ability to bring up the various portions and background processes (daemons) of the MEL

c. The ability to automatically monitor the state of the MEL background processes (daemons) and restart those found to be not running.

3.10 TESTING TEST SITES

The Testing Subsystem is used to perform the qualification tests of the other CSCIs and Subsystems. To do so, it must perform as expected.

3.10.1 SOFTWARE ITEMS

To test the Testing Subsystem, stress tests and parameter variations must be done. For certain tests more powerful host computers may be required, so load monitors on the host computer must be used. All of the MEL CSCIs must be installed and on an operational network.

3.10.2 HARDWARE ITEMS

The MEL will initially be tested using a Test Subsystem hosted on a Pentium 133 MHz PC using the Linux operating system. For the stress tests, NRL's SGI eight-processor Onyx will be used. To access all the various portions of the MEL fast enough, the Test Subsystem must be close to the backbone of the Internet. Tests have indicated that for the present tests the NRL Washington, DC network is adequate.

3.10.3 OTHER MATERIALS

TBD

> (The DID states that, "This paragraph shall identify and describe any other materials needed for the testing at the test site(s). These materials may include manuals, software listings, media containing the software to be tested, media containing data to be used in the tests, sample listings of outputs, and other forms or instructions. This paragraph shall identify those items that are to be delivered to the site and those that are expected to be supplied by the site. The description shall include the type, layout, and quantity of the materials, as applicable. This paragraph shall identify any classified processing or other security or privacy issues associated with the items.")

3.10.4 PROPRIETARY NATURE, ACQUIRER'S RIGHTS, AND LICENSING

TBD

> (The DID states that, "This paragraph shall identify the proprietary nature, acquirer's rights, and licensing issues associated with each element of the software test environment.")

3.10.5 INSTALLATION, TESTING, AND CONTROL

The Testing Subsystem consists of perl scripts on a Web server. The installation is therefore the same as for any other Web server software that accesses a local database.

Testing of the installation consists of performing the desired CSCI and Subsystem tests and explaining the errors as being due to the tested item.

Since the Testing Subsystem stress test software has the ability to jam and bring down the MEL, extreme caution needs to be used when using this software. It is password protected and will be under distribution control since it can be operated from anywhere on the Internet with the same effects.

The Keyword Test is also MEL resource intensive, in part due to the extremely large number of keywords that can be automatically tested in a short time. This test is also password and distribution controlled.

3.10.6 PARTICIPATING ORGANIZATIONS

Testing will be led by Code 7210 of the NRL Washington, DC, but all the MEL developers have a role in testing the test software.

3.10.7 PERSONNEL

Dr. John Spencer (NRL) - Testing Group Lead

James Gillespie (Kaman Sciences Corporation) - Testing Group Programmer

Chuck Stein (Mirror Imaging) - MEL Technical Lead

> (The DID states that, "This paragraph shall identify the number, type, and skill level of personnel needed during the test period at the test site(s), the dates and times they will be needed, and any special needs, such as multi-shift operation and retention of key skills to ensure continuity and consistency in extensive test programs.")

3.10.8 ORIENTATION PLAN

TBD

> (The DID states that, "This paragraph shall describe any orientation and training to be given before and during the testing. This information shall be related to the personnel needs given in paragraph 3.10.7. This training may include user instruction, operator instruction, maintenance and control group instruction, and orientation briefings to staff personnel. If extensive training is anticipated, a separate plan may be developed and referenced here.")

3.10.9 TESTS TO BE PERFORMED

The following tests will be performed on the Testing Subsystem:

    a.   Ability to perform all of the HTML API functions

    b.   Ability to perform all of the JAVA API functions

    c.   Ability to generate MEL queries in the times specified down to the shortest time required by MEL specifications

    d.   Ability to test all the specifications of the MEL Query Subsystem

    e.   Ability to test all the specifications of the MEL Metadata Subsystem

    f.   Ability to test all the specifications of the MEL Order Subsystem

    g.   Ability to test all the specifications of the MEL Subscription Subsystem

    h.   Ability to test all the specifications of the MEL Data Subsystem

    i.   Ability to test all the specifications of the MEL Administration Subsystem

3.11 MAINTENANCE OPERATIONAL ASSESSMENT TEST SITES

The entire MEL is the test site for the life cycle maintenance operational assessments. These are done to assess the operational performance of the MEL following OTRR.

3.11.1 SYSTEM ITEMS

MEL life cycle maintenance operational assessments.

3.11.2 HARDWARE ITEMS

NOT APPLICABLE

3.11.3 OTHER MATERIALS

NOT APPLICABLE

3.11.4 PROPRIETARY NATURE, ACQUIRER'S RIGHTS, AND LICENSING

NOT APPLICABLE

3.11.5 INSTALLATION, TESTING, AND CONTROL

TBD

> (The DID states that, "This paragraph shall identify the developer's plans for performing each of the following, possibly in conjunction with personnel at the test site:
>
> a. Acquiring or developing each element of the software test environment.
>
> b. Installing and testing each item of the software test environment prior to its use
>
> c. Controlling and maintaining each item of the software test environment.")

3.11.6 PARTICIPATING ORGANIZATIONS

TBD

> (The DID states that, "This paragraph shall identify the organizations that will participate in the testing at the test site(s) and the roles and responsibilities of each.")

3.11.7 PERSONNEL

TBD

> (The DID states that, "This paragraph shall identify the number, type, and skill level of personnel needed during the test period at the test site(s), the dates and times they will be needed, and any special needs, such as multi-shift operation and retention of key skills to ensure continuity and consistency in extensive test programs.")

3.11.8 ORIENTATION PLAN

TBD

> (The DID states that, "This paragraph shall describe any orientation and training to be given before and during the testing. This information shall be related to the personnel needs given in paragraph 3.11.7. This training may include user instruction, operator instruction, maintenance and control group instruction, and orientation briefings to staff personnel. If extensive training is anticipated, a separate plan may be developed and referenced here.")

3.11.9 TESTS TO BE PERFORMED

The following tests will be performed:

    a.   Hyperlink viability - ensure all hyperlinks are valid

    b.   Access Site availability - each Access Site must be operational

    c.   Regional Site availability - Regional Sites must be operational

    d.   Dataset availability - advertised datasets must be deliverable

    e.   MTBF and MTTR - operating logs and tests will be used to determine the time between failures and the time to repair

    f.   Review of the Operational Concept Document (OCD) - the OCD must be followed

SECTION 4. TEST IDENTIFICATION

4.1 GENERAL INFORMATION

This section presents general information applicable to the overall testing.

4.1.1 TEST LEVELS

The Alpha Test and Beta Test will concentrate on the component level, but will also include system and subsystem level tests. Initial operational testing will be performed at the system and subsystem level.

4.1.2 TEST CLASSES

The Alpha Test and Beta Test will test and evaluate the functionality of the components and system. Initial operational testing will also test data content against requirements.

4.1.3 GENERAL TEST CONDITIONS

Alpha testing will be conducted in a laboratory environment and will serve as the initial functionality test for the component. After successful completion of Alpha tests, Beta testing will be conducted on the network, on a not-to-interfere basis, with a previously released version of the system. Only following completion of OTRR will the system become available to the general user.

4.1.4 TEST PROGRESSION

Testing will be done at the CSCI level before system and subsystem level testing. Subsystem level tests should be done in the following sequence:

- a. Query Metadata
- b. Metadata Server Test
- c. Order Form Generation Test
- d. Deliverability Test
- e. Proper Data Test
- f. Web Administration Test
- g. User Load Stress Test

h.   Ability to meet availability specifications test

4.1.5 DATA RECORDING, REDUCTION, AND ANALYSIS

During each test, data will be manually and automatically recorded according to the type of test. Discrepancies, errors or malfunctions will be classified as Critical or Non-Critical. All Critical and Non-critical items will be assigned a unique identifier to allow their tracking through the correction cycles. Most data will be recorded into databases that are accessible via a Web browser.

The analysis of the test results will mostly be done by hand on a one-by-one basis due to their nature. Automatic tools and advanced algorithms will be used where possible.

4.2 PLANNED TESTS

4.2.1 QUERY METADATA TITLES

4.2.1.1 PURPOSE

`Mj.cgi` and `mh.cgi` take the place of a human user when interacting with the MEL Access Site. These programs request a list of all current metadata titles from the MEL. For the HTML MEL query form, `mh.cgi` uses the date range of January 1, 1900 to the present. For the JAVA query form, `mj.cgi` leaves the date unspecified. Currently, both methods are capable of accessing all metadata that is in the MEL.

4.2.1.2 AVAILABILITY

These programs are run automatically every hour. They are also available online and may be run at any time. They are available at:

> *http://rsd-www.nrl.navy.mil/mel/metadata.html*

4.2.1.3 RESULTS

Both automated and user-initiated runs are logged into a database. Logged data includes the UNIX time stamp of the run and which titles were present in the results returned from the MEL.

4.2.2 METASTAT

4.2.2.1 PURPOSE

`Ms.cgi` reads the database created by `mj.cgi` and `mh.cgi` to generate several graphs of the status of the MEL. For each access method, a plot of which titles were returned for each run is generated. This shows which sites are up consistently, and which ones have availability problems for whatever reason. The other plot generated is the overall number of titles returned for each query form. This gives a visual picture of the overall health of the system, and shows the amount of available data from the system fluctuates regularly.

4.2.2.2 AVAILABILITY

The METASTAT program may be run at any time. It is available at:

http://rsd-www.nrl.navy.mil/mel/metastat.html

4.2.2.3 RESULTS

The reports are plotted interactively within the user's Web browser for the time period specified.

4.2.3 METADATA KEYWORD TEST

4.2.3.1 PURPOSE

K1.cgi allows a file of keywords to be searched against the MEL. This can be done for a single metadata file or for the entire MEL. The results can then be examined to ensure hits for desired keywords exist and hits for undesired keywords do not happen.

4.2.3.2 AVAILABILITY

The Metadata Keyword Test is available from the MEL Testing Group Web page. Running the program requires access to the password, but the two reports can be accessed by anyone. The first report is a summary report containing information of the form, "There were 12 hits for the keyword *data*." The second report also includes the twelve titles that were found for this keyword.

4.2.4 USER LOAD STRESS TEST

4.2.4.1 PURPOSE

`P4.2.cgi` allows concurrent requests for one dataset from the MEL to test the ability to handle multiple, nearly-simultaneous data requests. The same dataset is

used for simplicity. The number of requests, and the delay between them can be dynamically set from the Web browser to see how the MEL Access Site and MEL Regional Site handle a large number of requests in a very short time.

4.2.4.2 AVAILABILITY

Most of the information needed to generate a valid order is coded into the program to speed its execution. Initial tests have shown that the program should be run from a large computer with a robust connection to the Internet to be capable of generating the orders fast enough. Because this program can affect the responsiveness of the operational MEL its availability is restricted.

4.2.4.3 RESULTS

The results of this stress testing must be seen while monitoring the MEL Job Control Block (JCB) using the MEL Administration Tool. The user must be ready and able to cancel orders that hang either at the Access Site or at the Regional Site.

4.2.5 DELIVERABILITY TEST

4.2.5.1 PURPOSE

`Pg2.cgi` orders some of every dataset in the MEL to ensure all advertised data are deliverable. This test has a fifteen-minute delay between orders and is not intended to generate a heavy load on the MEL system. It should be run at off-peak times such as Sunday nights.

4.2.5.2 AVAILABILITY

This program is under development and is not fully functional at this time.

4.2.5.3 RESULTS

This program does not test the online linkage of the Type 1 data delivery mechanism. It does test for delivery of fully compliant data using the default amount of data described in the dataset metadata.

4.2.6 WEB ADMINISTRATION

4.2.6.1 PURPOSE

This test checks the Web Administration interfaces, specifically those associated with the Administrator/Developer Tool and User Cancel/Unsubscribe interface.

4.2.6.2 AVAILABILITY

There is no program for this test since the Administrator/Developer Tool and the User Cancel/Unsubscribe interface have GUI interfaces and must be tested using a Web browser.

4.2.6.3 RESULTS

The results of this test will be evident in the JCB and should appear in the final report.

4.2.7 WEB CRAWLER

4.2.7.1 PURPOSE

This program checks all the hyperlinks on the MEL Access Site to ensure they are viable. In depth, it only checks to the first non-Access Site page.

4.2.7.2 AVAILABILITY

This program is run automatically every Sunday night during off-peak hours.

4.2.7.3 RESULTS

The Web Crawler results are posted at the following URL:

http://rsd-www.nrl.navy.mil/local/

4.2.8 WEB PAGE CHANGE DETECTION

4.2.8.1 PURPOSE

This program checks a list of Web pages and URLs and sends e-mail reporting detected changes. It does not actually download each page, but only checks for page size, so it can be fooled by pages that change while maintaining page size.

4.2.8.2 AVAILABILITY

This program is written in a combination of Perl and C programming languages and is only available for UNIX computers. It can be programmed to run each weekday morning at 4:00 a.m. Eastern time.

4.2.8.3 RESULTS

The detected changes are e-mailed to the specified user at the completion of the run.

SECTION 5. TEST SCHEDULES

TBD

> (The DID states that, "This section shall contain or reference the schedules for conducting the tests identified in this plan. It shall include:

a)   A listing or chart depicting the sites at which the testing will be scheduled and the time frames during which the testing will be conducted.

b)   A schedule for each test site depicting the activities and events listed below, as applicable, in chronological order with supportive narrative as necessary:

a.   On-site test period and periods assigned to major portions of the testing.

b.   Pre-test on-site period needed for setting up the software test environment and other equipment, system de-bugging, orientation, and familiarization.

c.   Collection of database/data file values, input values, and other operational data needed for the testing.

d.   Conducting the tests, including planned re-testing.

e.   Preparation, review and approval of the Software Test Report (STR).")

SECTION 6. REQUIREMENTS TRACEABILITY

(The DID states that, "This section shall contain:

a. Traceability from each test identified in this Plan to the CSCI requirements and, if applicable, software system requirements it addresses. (Alternatively, this traceability may be provided under paragraph 4.2.x and referenced from this section.)

b. Traceability from each CSCI requirements and, if applicable, each software system requirement covered by this Test Plan to the test(s) that address it. The traceability shall cover the CSCI requirements in all applicable Software Requirements Specification (SRS) documents, and for software systems the system requirements in all applicable System/Subsystem Specification (SSS) documents and associated Interface Requirements Specification (IRS) documents.")

6.1 REQUIREMENT VERIFICATION METHODS

Verification ensures the functional, performance, interface, and design requirements are properly addressed. Verification of MEL software requirements will be performed by Test, Demonstration, Analysis, and Inspection methods described in the following paragraphs.

6.1.2 TEST

Verification by test involves exercising the software against quantitatively specified criteria. Where criteria are specified in terms of probability, analysis will be performed to set the test conditions and performance limits needed to provide the verification.

6.1.2 DEMONSTRATION

Verification by Demonstration involves exercising the software to show specified qualitative functions and capabilities can be performed.

6.1.3 ANALYSIS

Verification by Analysis involves a mathematical treatment including computer analyses using appropriate models and simulations, to determine compliance with requirements. Analysis may be used where other methods are not feasible or may be combined with Test results to provide verification of a requirement.

SOFTWARE TEST PLAN

6.1.4 INSPECTION

Verification by Inspection typically involves observation of software characteristics to determine compliance with specified requirements.

6.2 ACCEPTANCE TESTING

Tests, demonstrations, analyses, and inspections will be performed and documented at the developer's facility to verify that requirements allocated to factory testing have been met. These tests will be done in a "dry run" mode by developers prior to shipment of software. Following installation and checkout, MEL software will also undergo Site Acceptance Testing to verify that no damage has occurred in shipment.

6.3 REQUIREMENTS MATRIX

The Matrix depicted in Table 6-1 on the following pages will be used for tracing MEL software requirements. It is based upon the MEL SRS.

Table 6-1. Requirements Traceability Matrix

		Alpha				Beta			
R EQUIREMENT	N/A	T	D	A	I	T	D	A	I
2.1 SUPPORT WARFIGHTERS & DECISION MAKERS, INSURE BATTLESPACE DOMINANCE, AND SUPPORT M&S FOR TRAINING, ANALYSIS & ACQUISITION									
2.1.1 AUTHORITATIVE									
2.1.1.1 Verification, Validation, & Accreditation (VV&A)									
2.1.1.2 Verification, Validation, & Certification (VV&C)									
2.1.1.3 Data Metrics									
2.1.1.4 Data Editing									
2.1.2 ROBUST/RELIABLE/SCALEABLE									
2.1.2.1 Availability									
2.1.2.2 Performance Specifications									
2.1.2.2.1 Reliability									
2.1.2.2.1.1 Mission reliability									
2.1.2.2.1.2 Hardware reliability prediction									
2.1.2.2.1.3 Software reliability prediction									
2.1.2.2.2 System Operational Availability									
2.1.2.2.3 Mean-Time-To-Restore (MTTRS)									
2.1.2.2.3.1 MTTRS (hardware)									
2.1.2.2.3.2 MTTRS (software)									
2.1.2.2.3.3 MTTRS (external failure)									
2.1.2.2.4 Failure Constraints									
2.1.2.2.4.1 Single Point Failure									
2.1.2.2.4.2 Propagation of Failure									
2.1.2.2.4.3 External Failures									
2.1.2.2.4.4 Data Integrity									
2.1.2.2.5 Error Handling/Failure Recovery									

SOFTWARE TEST PLAN

Requirement	N/A	Alpha				Beta			
		T	D	A	I	T	D	A	I
2.1.2.2.5.1 Communication/Power Disruptions									
2.1.2.2.5.2 Communications Recovery									
2.1.2.2.5.3 Communications Error Handling									
2.1.2.2.5.4 Software Error Handling									
2.1.2.2.5.5 Error Detection									
2.1.2.2.5.6 Error Retry									
2.1.2.2.6 Maintenance									
2.1.2.2.6.1 Preventive Maintenance									
2.1.2.2.6.1.1 Hardware									
2.1.2.2.6.1.2 Software									
2.1.2.2.6.2 Corrective Maintenance									
2.1.2.2.6.2.1 Hardware									
2.1.2.2.6.2.2 Software									
2.1.2.2.7 Diagnostics and Test Databases									
2.1.2.2.8 Design Lifetime									
2.1.2.2.9 Testability									
2.1.2.2.9.1 Monitoring, Diagnostics, and Fault Isolation									
2.1.2.2.9.2 Off-line Testing									
2.1.2.2.9.3 Ease of Inspection									
2.1.2.2.9.3.1 Access to equipment									
2.1.2.2.9.3.2 Equipment selection									
2.1.2.2.9.3.3 Labeling									
2.1.2.2.10 Health & Safety Criteria									
2.1.2.3 General Architecture									
2.1.2.4 Mirroring of High Value Data									
2.1.2.5 Forward Staging Architecture									
2.2 PROVIDE NATURAL ENVIRONMENTAL INFORMATION, PRODUCTS, & DATA									
2.2.1 THREE-TIER DATA WAREHOUSE									
2.2.1.1 Client Site									
2.2.1.2 Access Site									
2.2.1.2.1 Prevent Request Overload									
2.2.1.2.2 Provide Indirect Addressing									
2.2.1.3 Regional Site									
2.2.1.3.1 Data Architecture									
2.2.1.3.1.1 Data Architecture and Design Parameters									
2.2.1.3.1.2 Data Management									
2.2.1.3.1.3 Reporting									
2.2.1.3.1.4 Framework Information									
2.2.1.3.1.5 Metadata									
2.2.1.3.2 Storage Capacity									
2.2.1.3.2.1 Product Data									
2.2.1.3.2.2 Management Data									
2.2.1.3.3 Growth Capacity									
2.2.1.3.3.1 Reserve Performance Capacity									
2.2.1.3.3.2 Growth Capability									
2.2.2 PETABYTE DATA LIBRARY									
2.2.2.1 Oceans									
2.2.2.1.1 Data and Model Output									
2.2.2.1.2 Model Software and Executables									
2.2.2.1.3 Documents & Descriptions									
2.2.2.2 Atmosphere									
2.2.2.2.1 Data and Model Output									

SOFTWARE TEST PLAN

Requirement	N/A	Alpha				Beta			
		T	D	A	I	T	D	A	I
2.2.2.2.2 Model Software & Executables									
2.2.2.2.3 Documents & Descriptions									
2.2.2.3 Space									
2.2.2.3.1 Data and Model Output									
2.2.2.3.2 Model Software and Executables									
2.2.2.3.3 Documents and Descriptions									
2.2.2.4 Terrain									
2.2.2.4.1 Data Collection and Information Products									
2.2.2.4.1.1 Input Requirements									
2.2.2.4.1.1.1 Digital data									
2.2.2.4.1.1.2 Intelligence data									
2.2.2.4.1.1.3 Digital hard copy imagery									
2.2.2.4.1.1.4 Image support data									
2.2.2.4.1.1.5 Hard copy cartographic data and textual material									
2.2.2.4.1.2 Output Requirements									
2.2.2.4.1.2.1 Framework information									
2.2.2.4.1.2.2 Standard product generation									
2.2.2.4.1.2.3 Collect source									
2.2.2.4.1.2.4 Source ingest									
2.2.2.4.1.2.5 Evaluate data									
2.2.2.4.1.2.6 Adjust data									
2.2.2.4.1.2.7 Extract data									
2.2.2.4.1.2.8 Integrate data									
2.2.2.4.1.2.9 Generate and manipulate metadata									
2.2.2.4.1.3 Performance Requirements									
2.2.2.4.1.3.1 Readiness posture									
2.2.2.4.1.3.2 Responsiveness posture									
2.2.2.4.2 NIMA Data and Model Output									
2.2.2.4.2.1 Aeronautical Data (TBD)									
2.2.2.4.2.2 Compressed Arc-Digitized Raster Graphic (CADRG) Data									
2.2.2.4.2.3 Controlled Image Base (CIB) Data									
2.2.2.4.2.4 Client Server Processing Environment (CSPE) Interface									
2.2.2.4.2.5 Geodesy & Geophysical Enhanced Production System (G&G EPS)									
2.2.2.4.2.6 Geodetic Information Management System (GIMS) Interface									
2.2.2.4.2.7 Geographic Names Processing System (GNPS) Interface									
2.2.2.4.2.8 Hydrographic Source Assessment System (HYSAS) Interface									
2.2.2.4.2.9 Modernized Catalog System (MCS) Interface									
2.2.2.4.2.10 Navigation Safety System (NSS) Interface									
2.2.2.4.2.11 Digital Production System (DPS) Interface Server									
2.2.2.4.2.12 Imagery Products Archive (IPA) Interface									
2.2.2.4.3 Non-NIMA Information Systems									
2.2.2.4.3.1 Defense Automatic Addressing System (DAAS) Interface									
2.2.2.4.3.2 Federal Logistics Information System (FLIS)									
2.2.3 PRODUCT GENERATORS									
2.2.3.1 Provide Capability for Derived Data									
2.2.3.1.1 Provide Tools for Data Product Generation									
2.2.3.1.2 Projections									
2.2.3.1.3 Provide Products in Near-Real-Time									

Requirement	N/A	Alpha				Beta			
		T	D	A	I	T	D	A	I
2.2.3.1.4 Provide Products in Off-line									
2.2.3.1.5 Use Major Shared Resource Centers (MSRCs)									
2.2.4 DATA MODELS (DM)									
2.2.4.1 Provide Default DoD Models									
2.2.4.2 Provide Multiple Non-DoD Data Models									
2.2.4.3 Value Added Data									
2.3 PROVIDE DIRECT & TIMELY ACCESS									
2.3.1 DISTRIBUTED/SECURE DATA									
2.3.1.1 Architecture Provides for Distributed Regional Sites									
2.3.1.2 Architecture Provides for Distributed Sources									
2.3.1.3 Security Database Maintained									
2.3.1.3.1 Group Profile									
2.3.1.3.2 User Profile									
2.3.1.3.3 Security Profile									
2.3.2 SECURE/OPEN NETWORK ACCESS									
2.3.2.1 External Communications Network Standards									
2.3.2.2 User Communications									
2.3.2.3 Gateways									
2.3.3 ACCESS TO CLASSIFIED/UNCLASSIFIED DATA									
2.3.3.1 User Services									
2.3.3.1.1 Graphical User Interface (GUI)									
2.3.3.1.2 Query									
2.3.3.1.2.1 Query Building									
2.3.3.1.2.2 Query Response									
2.3.3.1.2.3 Query Parameters									
2.3.3.1.2.4 Browse Services									
2.3.3.1.3 Order									
2.3.3.1.3.1 Order Building									
2.3.3.1.3.2 Order Response									
2.3.3.1.3.3 Order Parameters									
2.3.3.1.3.4 Order Security									
2.3.3.1.3.5 Profile Based Requests									
2.3.3.1.3.6 Standard Stocked Orders									
2.3.3.1.3.7 Ad Hoc Orders									
2.3.3.1.3.8 Custom Order									
2.3.3.2. Security									
2.3.3.2.1 Security Policy									
2.3.3.2.1.1 Discretionary Access Control									
2.3.3.2.1.2 Mandatory Access Control									
2.3.3.2.1.3 Object Reuse									
2.3.3.2.1.4 Labels									
2.3.3.2.1.4.1 Label integrity									
2.3.3.2.1.4.2 Exportation of labeled information									
2.3.3.2.1.4.3 Exportation to multi-level devices									
2.3.3.2.1.4.4 Exportation to single-level devices									
2.3.3.2.1.4.5 Labeling human-readable output									
2.3.3.2.1.4.6 Subject sensitivity labels									
2.3.3.2.1.4.7 Device labels									
2.3.3.2.2 Accountability									
2.3.3.2.2.1 Identification and Authentication									
2.3.3.2.2.1.1 Trusted path									
2.3.3.2.2.1.2 Audit									

SOFTWARE TEST PLAN

		Alpha				Beta			
Requirement	N/A	T	D	A	I	T	D	A	I
2.3.3.2.3 Assurance									
2.3.3.2.3.1 System Architecture									
2.3.3.2.3.2 System Integrity									
2.3.3.2.3.3 Trusted Facility Management									
2.3.3.2.4 TEMPEST									
2.3.3.2.5 Physical Security									
2.3.3.2.6 Information Transfer									
2.3.3.2.6.1 Information Flow									
2.3.3.2.6.2 Data Validation									
2.3.3.2.6.3 Information Review									
2.4 PROVIDE A COMMON, INTEROPERABLE VIEW									
2.4.1 MINIMAL USER HARDWARE/SOFTWARE REQUIREMENTS									
2.4.1.1 Help									
2.4.1.2 User Interface									
2.4.1.3 Toolbox									
2.4.1.3.1 Administrative Tools									
2.4.1.3.2 Operational Tools									
2.4.1.3.3 Maintenance Tools									
2.4.1.4 Data Delivery									
2.4.2 OPEN, STANDARDIZED HARDWARE/SOFTWARE PRACTICE									
2.4.2.1 Portability and Interoperability									
2.4.2.2 Support Standardization formulation and promulgation									
2.4.2.3 Maintainability									
2.4.3 STANDARD INTERCHANGE FORMATS									

SECTION 7. NOTES

The consolidated MEL Glossary is available online at the following URL:

http://rsd-www.nrl.navy.mil/mel/

A listing of all acronyms and abbreviations used in this document is included as Appendix G.

APPENDIX A. MASS SAT

TBD

(The DID states that, "Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each Appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).")

APPENDIX B. MASS DTRR

TBD

(The DID states that, "Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each Appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).")

APPENDIX C. MASS OTRR

TBD

> (The DID states that, "Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each Appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).")

APPENDIX D. MRSS SAT

TBD

> (The DID states that, "Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each Appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).")

APPENDIX E. MRSS DTRR

TBD

> (The DID states that, "Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each Appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).")

APPENDIX F. MRSS OTRR

TBD

> (The DID states that, "Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each Appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).")

E

F

FLIS .... Federal Logistics Information System

FTP...................................... File Transfer Protocol

G

G&G EPS .... Geodysy & Geophysical Enhanced Production System

GIMS.................................... Geodetic Information Management System

GNPS .... Geographic Names Processing System

GUI .... Graphical User Interface

H

HTML .... Hypertext Markup Language

HYSAS................................. Hydrographic Source Assessment System

I

IOT&E .... Initial Operational Testing and Evaluation

IPA .... Imagery Products Archive

IRS .... Interface Requirements Specification

J

JCB...................................... Job Control Block

JITC..................................... Joint Interoperability Testing Center

K-L-M

M&S..................................... Modeling and Simulation

MARC .... Machine Readable Catalog

MASS................................... MEL Access Site Software

MCM.................................... MEL Component Manager

MCS .... Modernized Catalog System

MEL .... Master Environmental Library

MHz .... Megahertz

MRSS................................... MEL Regional Site Software

MSRR................................... Major Shared Resource Center

Mean Time To Restore

MUSS.....................................MEL User Site Software

N

NAVOCEANO ....Naval Oceanographic Office

NIMA ....National Imagery and Mapping Agency

NRL.....................................Naval Research Laboratory

NSS ....Navigation Safety System

O

OCD ....Operational Concept Description

OTRR...................................Operational Test Readiness Review

P

PC..Personal Computer

Q-R-S

SAT......................................Software Acceptance Test

SDBF ....Simulator Database Facility, Albuquerque, NM

SRS ....Software Requirements Specification

SSS......................................System/Subsystem Specifications

T

TBD.....................................To Be Determined

U

URL.....................................Universal Resource Locator

USD(A&T)...........................Undersecretary of Defense for Acquisition and Technology

V

VJM...................................... Virtual Java Machine

VV&A .... Verification, Validation, and Accreditation

VV&C .... Verification, Validation, and Certification

W-X-Y-Z

WWW................................... World Wide Web